SESSION: PHYSICS

PROPERTIES OF HERMITE AND LAGUERRE POLYNOMIALS USING SUPERSYMMETRIC QUANTUM MECHANICS (SUSYQM)

Chad A. Husko, Brenton J. Knuffman, Asim Gangopadhyaya* and Jeffry V. Mallow*

Department of Physics, Loyola University Chicago

6525 N. Sheridan, Chicago, Illinois 60626

E-mail: chusko@luc.edu, bknuff@yahoo.com

Abstract:

We applied the algebraic methods of Supersymmetric Quantum Mechanics (SUSYQM) to the Hermite and Laguerre differential equations. A natural operator algebra of SUSYQM reproduced the solutions to the harmonic oscillator and the hydrogen atom and led to recursion relations among related polynomials. This method provides a different perspective on these polynomials and can be easily extended to explore other polynomials of modern physics.